

FIG. 1

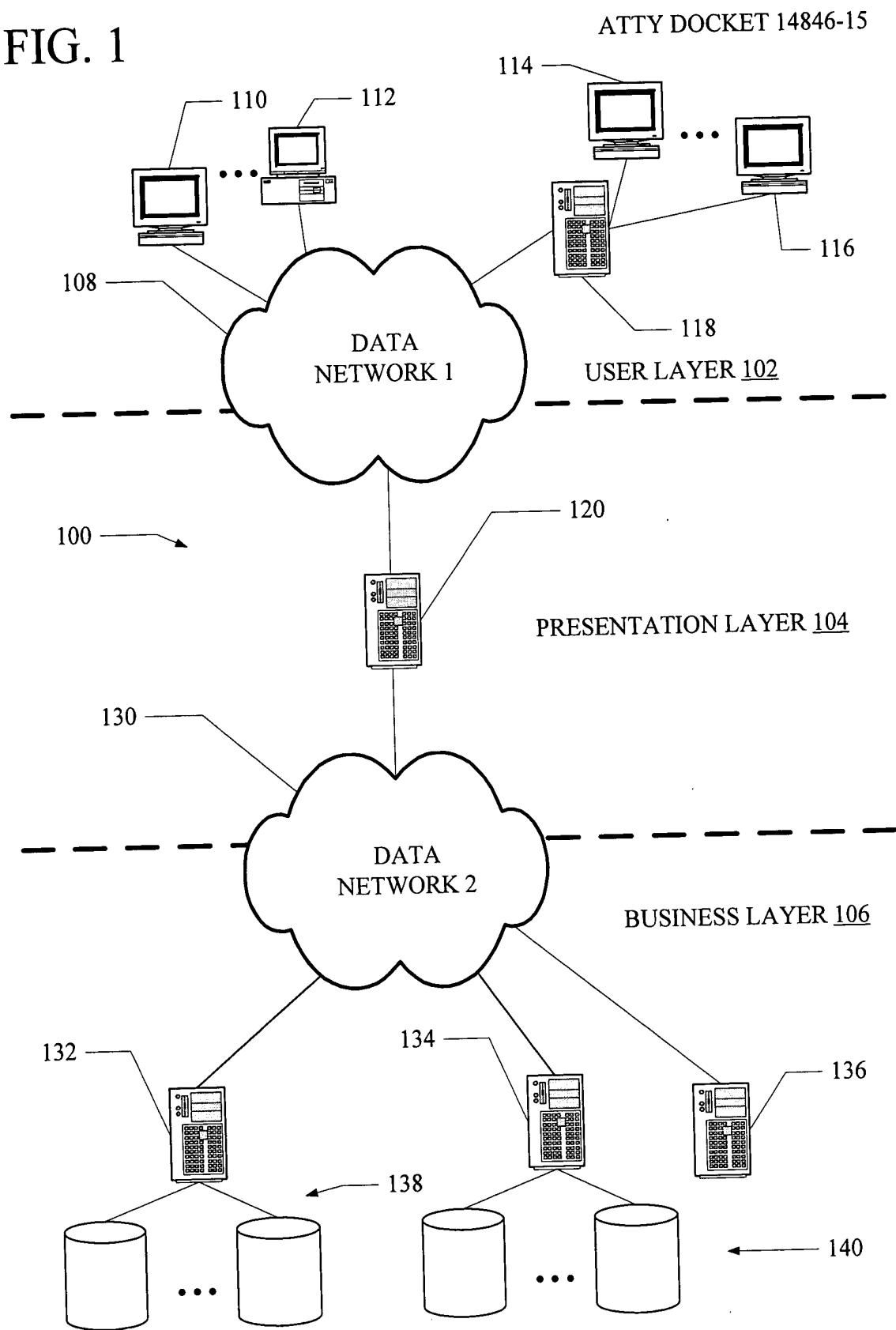


FIG. 2

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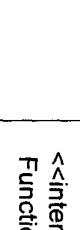
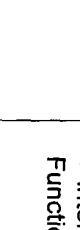
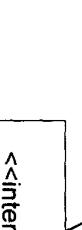
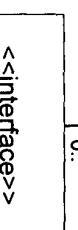
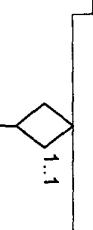
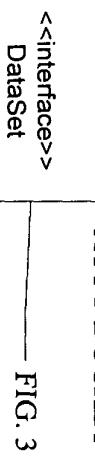


FIG. 3

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```
public interface DataSet extends java.io.Serializable
{
    // standard getters & setters for indexed properties
    // including both index and array-based getters & setters
    public setItem(int index, Item itemValue);
    public Item getItem(int index);
    public void setItem(Item items[]);
    public Item[] getItem();

    // utility method to determine the number of items in
    // this data set
    public int numOfItems();

    // utility methods to permit 'pull' processing
    public Item findItem(String name);
    public FunctionItem findFunctionItem(String name);
    public DataItem findDataItem(String name);

    public boolean equals(DataSet dataSet);

    public String toString();
}
```

FIG. 4

```
public interface Item extends java.io.Serializable
{
    public String getName();

    public boolean equals(Item item);
}
```

FIG. 5

```
public interface FunctionItem extends Item
{
    // utility methods for function tree navigation
    Iterator childItems();
    boolean isCallable();

    public int functionType();

    public boolean equals(FunctionItem functionItem);

    public static final int FUNCTION_SET_TYPE = 0;
    public static final int LAST_RESERVED_FUNCTION_TYPE = 10000;
}
```

FIG. 6

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```
public interface Function extends FunctionItem
{
    // invoke the function remotely - either no arguments or with
    // an arbitrary array of arguments
    public Object invokeRemote();
    public Object invokeRemote(Object args[]);

    public Object invokeLocally();
    public Object invokeLocally(Object args[]);

    public boolean isLocal();
    public boolean isRemote();

    public boolean equals(Function function);

    public String toString();
}
```

FIG. 7

```
public interface FunctionSet extends FunctionItem
{
    // standard getters & setters for indexed properties
    public functionItem(int index, FunctionItem functionItemValue);
    public FunctionItem functionItem(int index);

    public void functionItem(FunctionItem functionItems[]);
    public FunctionItem[] functionItem();

    // utility method to determine the number of function items in
    // this function set
    public int numOfFunctionItems();

    public boolean equals(FunctionSet functionSet);
}
```

FIG. 8

```
public interface DataItem extends Item
{
    public boolean equals(DataItem dataItem);
}
```

FIG. 9

```
public interface DataValue
{
    public Object getValue();

    public Domain getDomain();

    public boolean equals(DataValue dataValue);

    public String toString();
}
```

FIG. 10

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```
public interface Domain extends java.io.Serializable
{
    public String getName();
    public boolean validate(Object value);
    public Iterator values();
    public boolean equals(Domain domain);
    public String toString();
}
```

FIG. 11

```
public interface Context extends java.io.Serializable
{
    public String getName();
    public boolean equals(Context context);
    public String toString();

    // tentative
    public Iterator retrieveInitialDomains();
    public Iterator retrieveNamedDomains(String [] domains);
    public DataSet retrieveInitialDataSet(UserId id);
}
```

FIG. 12

```
public interface DomainHome
{
    public Domain findDomain(String name);
    public Domain findDomain(Context context, String name);

    // tentative
    public void registerDomain(Domain domain);
    public void registerDomain(Domain domain, Context context);
}
```

FIG. 13

```
public interface RangeDomain extends Domain
{
    public Object lowerBound();
    public Object upperBound();

    public boolean validate(Object value);

    public Iterator values();

    public String toString();
}
```

FIG. 14

```
public interface DiscreteDomain extends Domain
{
    public boolean validate(Object value);

    public Iterator values();

    public String toString();
}
```

FIG. 15

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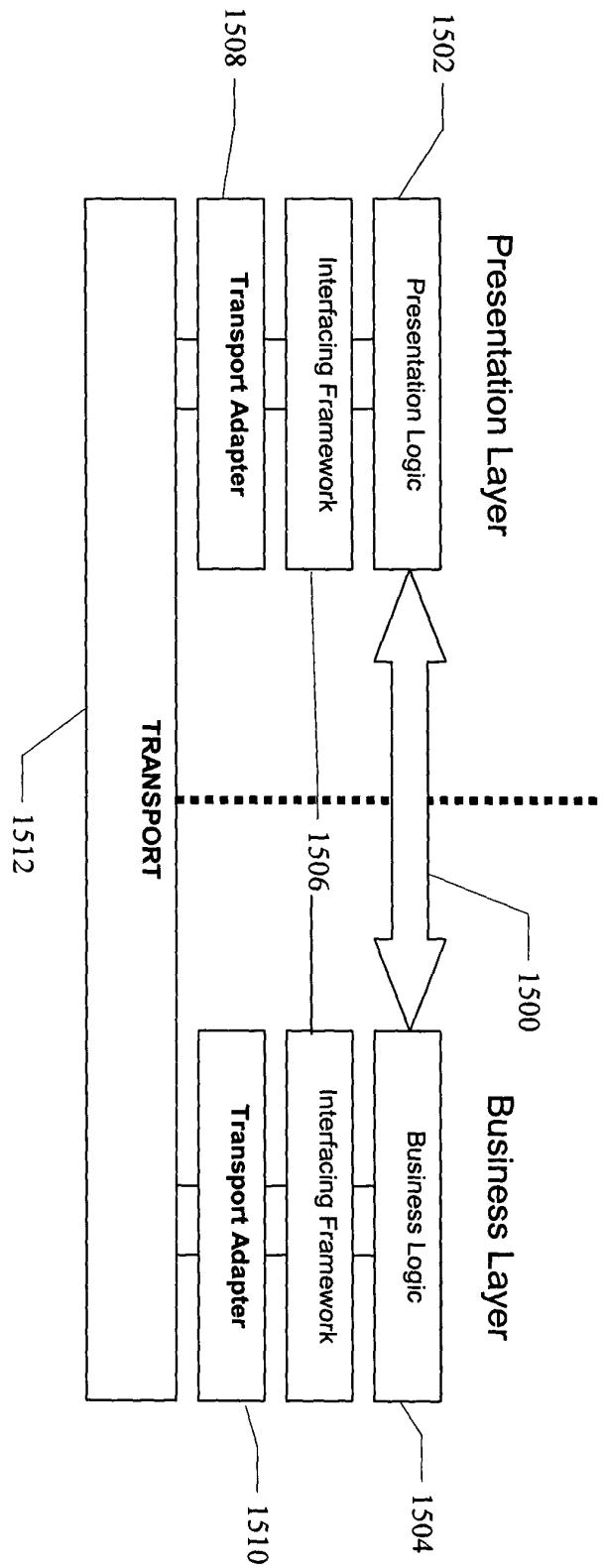


FIG. 16

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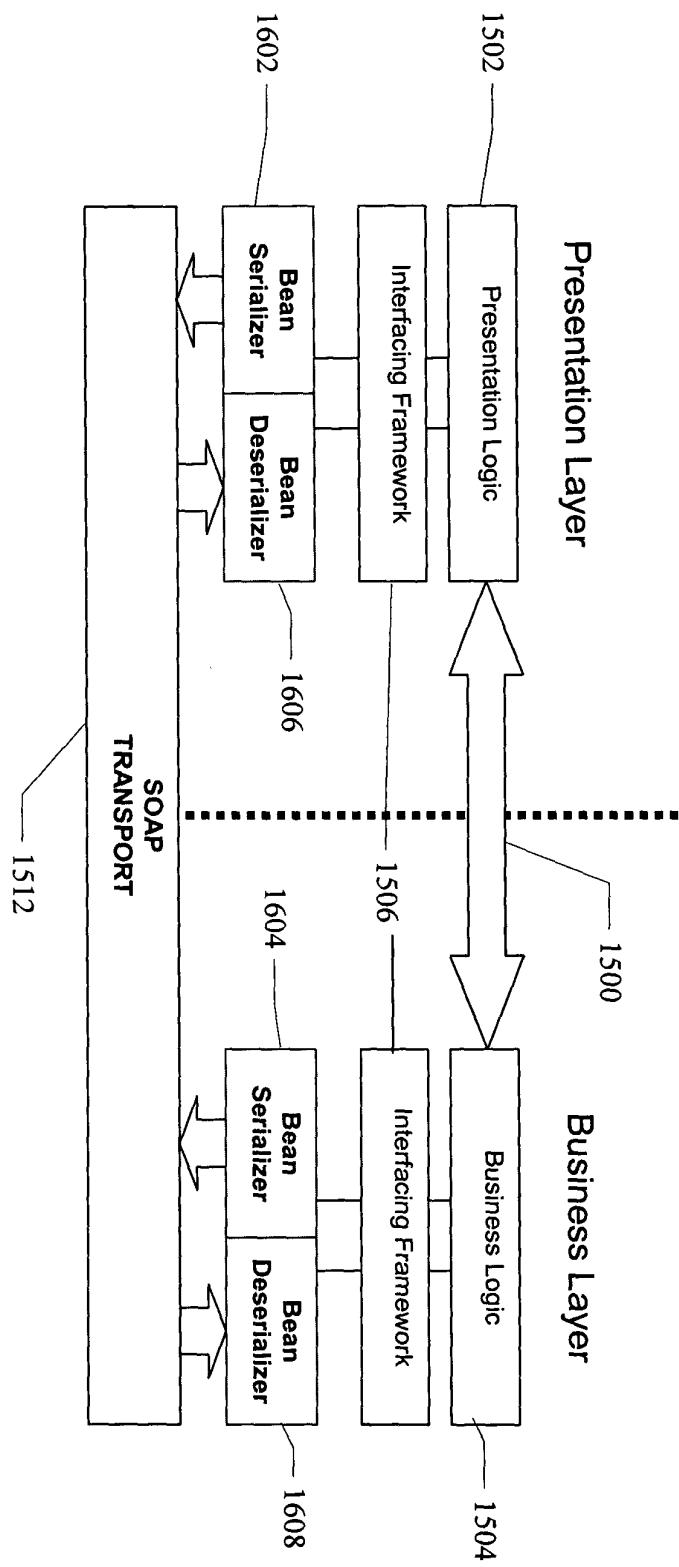


FIG. 17

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